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AUTHOR	Snow, Richard E.
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ABSTRACT

This report provides an initial overview of the Model Teacher Training System, the development of which is a major goal of the Program on Teaching Effectiveness of the Stanford Center for Research and Development in Teaching. Detailed explication of its development will be presented in subsequent reports. Separate presentations will be prepared for each system element; selection, diagnosis, and placement; programmed training; practice; non-programmed training; assignment and followup; assessment; and system revision. Provisional decisions have been made to focus the model system on the vestibule training of public school teachers in skills generalizable across content areas of science, mathematics, social studies, and English for grades 3-12. It is noted, however, that the training system should be of use at many points in a continuing program of preservice and in-service teacher education. Initial steps have been taken to clarify design problems concerning the particular kinds of skills to be included in the training system and the means by which the system can be made adaptive to individual institutional, and community needs. These design decisions and problems may also be the subject of subsequent reports. A seven-item bibliography is included. (Author)

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A MODEL TEACHER TRAINING SYSTEM: AN OVERVIEW

Richard E. Snow

School of Education
Stanford University
Stanford, California

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Introductory Statement

The Center's mission is to improve teaching in American schools. Too many teachers still employ a didactic style aimed at filling passive students with facts. The teacher's environment often prevents him from changing his style, and may indeed drive him out of the profession. And the children of the poor typically suffer from the worst teaching.

The Center uses the resources of the behavioral sciences in pursuing its objectives. Drawing primarily upon psychology and sociology, but also upon other behavioral science disciplines, the Center has formulated programs of research, development, demonstration, and dissemination in three areas. Program 1, Teaching Effectiveness, is now developing a Model Teacher Training System that can be used to train both beginning and experienced teachers in effective teaching skills. Program 2, The Environment for Teaching, is developing models of school organization and ways of evaluating teachers that will encourage teachers to become more professional and more committed. Program 3, Teaching Students from Low-Income Areas, is developing materials and procedures for motivating both students and teachers in low-income schools.

This memorandum describes the Model Teacher Training System, a major goal of the Program on Teaching Effectiveness.

Abstract

This report provides an initial overview of the Model Teacher Training System, the development of which is a major goal of the Program on Teaching Effectiveness of the Stanford Center for Research and Development in Teaching. Detailed explication of its development will be presented in subsequent reports. Separate presentations will be prepared for each system element: selection, diagnosis, and placement; programmed training; practice; nonprogrammed training; assignment and follow-up; assessment; and system revision. Provisional decisions have been made to focus the model system on the vestibule training of public school teachers in skills generalizable across the content areas of science, mathematics, social studies, and English for grades 3-12. It is noted, however, that the training system should be of use at many points in a continuing program of preservice and in-service teacher education. Initial steps have been taken to clarify design problems concerning the particular kinds of skills to be included in the training system and the means by which the system can be made adaptive to individual, institutional, and community needs. These design decisions and problems may also be the subject of subsequent reports.

A MODEL TEACHER TRAINING SYSTEM: AN OVERVIEW

Richard E. Snow

The coming decades will require of teachers a degree of inquiry, inventiveness, and adaptation to the needs of individual learners not often seen in the teaching styles of the past. Human teaching will need to complement not only the increased use of instructional technology for expository teaching, but also the widespread development of educational communications media in our society generally. To date, there has been little attempt to develop the kinds of teacher training needed to promote these complementary teaching skills.

The Center's Program on Teaching Effectiveness seeks to define and understand these human teaching skills, and to explore their relation to important learning outcomes.* A key idea in our growing conception of effective teaching is the adaptation of human teaching to fit particular needs of individual learners at particular points in the learning process. Adaptive teaching attempts to help a learner over or around a block he faces by capitalizing on his known strengths or compensating for his weaknesses. Such teaching will often be extemporaneous, arising as response to the disruption or frustration of normal learning processes, and is engaged in with experimental as well as helping attitudes. It is characterized by flexibility of approach both within and between learners.

In its earlier phases, the Program on Teaching Effectiveness concentrated on analyzing teaching into component skills and developing a modeling and microteaching approach to skill training for teacher education, with associated psychological research on cognitive and affective interactions in the teaching-learning process.

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*Until recently the term "heuristic" was used by the Center to describe these skills. Because that term was often understood as having narrower connotations than were intended, the name of the Heuristic Teaching Program has been changed to the Program on Teaching Effectiveness.

The current program strategy is to synthesize individual skills into coherent sequences and styles of effective teaching, to develop a prototype teacher-training system that combines separate skill-training procedures into an integrated program for teacher training, and to develop means for assessing heuristic teaching skills in terms of effects on learning outcomes. Thus, a major goal of the program is the development of a model teacher training system.

The purpose of this paper is to sketch the model training system as it is currently envisaged and to discuss some important design decisions to be faced in the work to come. The discussion is admittedly idealistic. Most of the system's elements are only now in early stages of development. Much research and development work must be completed before we can expect even to approximate the vision projected here. As the work proceeds, subsequent papers in this series will describe in detail the individual system elements as they are actually constructed.

General Specifications

The system is not planned to be a comprehensive teacher education program in the conventional sense, though it could be used as a component of conventional teacher education programs, or of other model teacher education programs (see e.g., Burdin & Lanzillotti, 1969). It will be an organization of current knowledge and products useful in training teachers. But the term "system" implies integrated elements, each engineered to serve its function and support other elements, and not simply a loose collection of experiences, a string of separate micro-teaching model tapes or minicourses. The system must be self-sufficient, specifying everything needed to make it work as designed, and must contain its own evaluation, or quality-control mechanism. It should also be adaptive, in response to feed-back from its own evaluation processes. The basic evaluation mechanism for this purpose will be a system of assessment based on learning criteria. The term "model" is used in the sense of "prototype" or "exemplar," providing a blueprint for further development. The system must be exportable to other sites, perhaps being modified to fit particular circumstances in each location.

Hence, it must be written down in the form of manuals, materials, directions, and the like. Separately, some of these pieces are represented in the kinds of products the program has already been developing, but they will henceforth be regarded only as byproducts along the main stream of program activity leading to the development of the training system.

Figure 1 shows a first schematic diagram of the model. Each of the major subsystems within the model is described in the following paragraphs.

1. Selection, diagnosis, and placement. Entering trainees would be tested using written and performance measures designed to diagnose general strengths and weaknesses as well as specific training needs. On the basis of this information, the training system would be individualized in two ways: trainees would work primarily on areas of weakness, and alternative training methods would be used with trainees of differing aptitudes related to training. Since either beginning or experienced teachers might enter the system, a wide range of individual differences would be expected and encouraged. The placement procedure would include counseled decisions about future specialized functions of the teacher, his role in a differentiated staff, etc. Validity studies of selection and placement measures would be conducted periodically as a regular part of system operation.

2. Programmed training. A programmed series of training experiences would be planned for each trainee, each element having specified objectives or criterion levels to be reached. Trainees could be exempted from any element at any time by passing the test for that element, but could not proceed in the programmed series without reaching specified criteria. Some of the criteria would be specified in terms of student behavior. In the programmed series would be found (a) skill-training experiences in explaining, listening, questioning, and the promotion of inquiry in students; (b) work on strategies of reinforcement for the development of achievement motivation and self-concept; (c) exercises in the management of group processes; (d) exercises in curriculum development in specific areas; (e) work on the development of personal and social competencies;

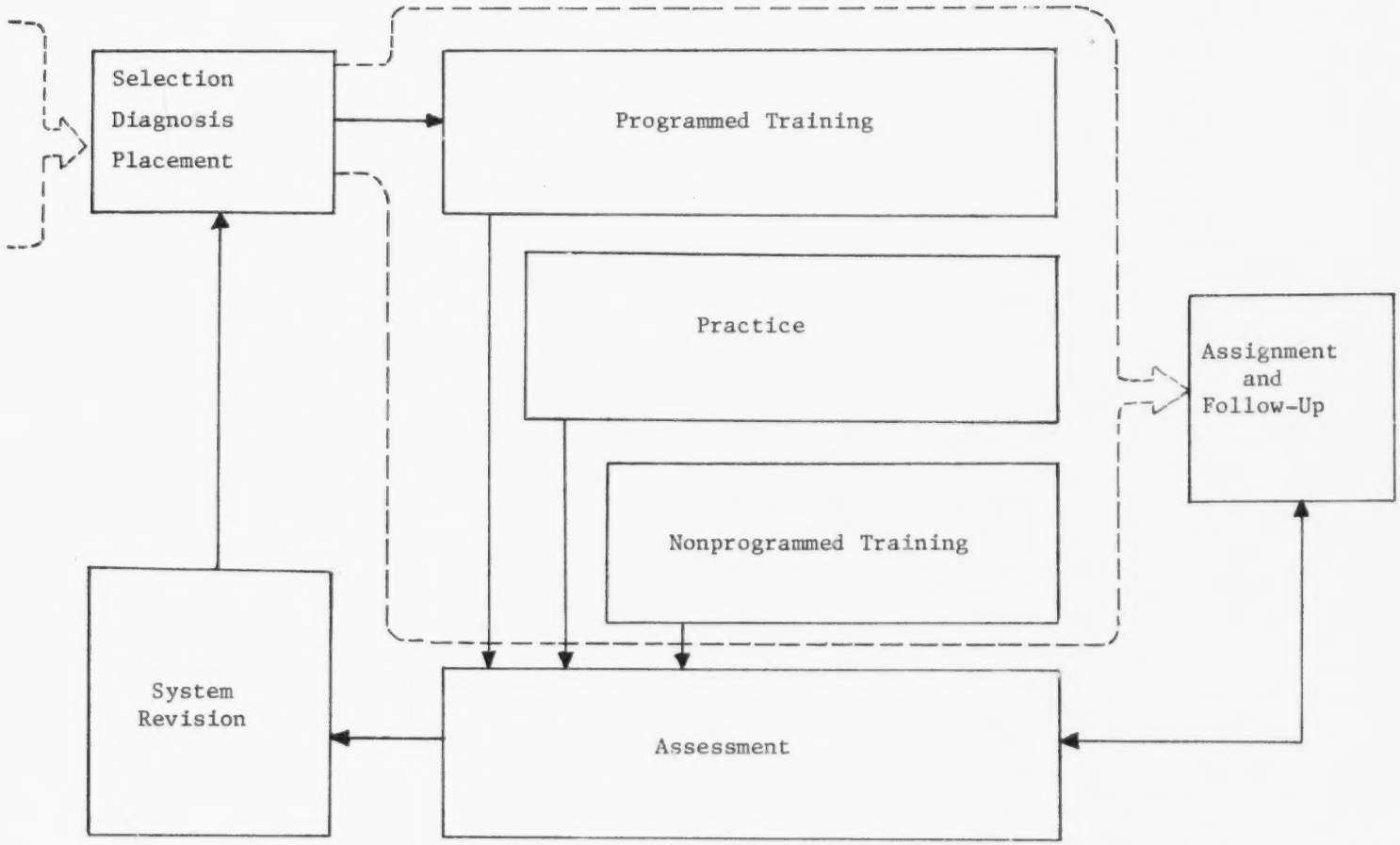

Fig. 1. Schematic representation of Model Teacher Training System showing flow of information (solid lines) and flow of trainees (dashed lines) through the system.

(f) laboratory experiences concerning the handling of classroom crises; and (g) training in the use of CAI, visual media, and other technology.

3. Practice. In a real sense, the core of the system consists of practice teaching. There would be intensive teaching experience in three kinds of situations: tutorial dialogue, microteaching with small groups, and regular classroom experience. Repetitive trials and detailed feedback, as in the classical microteaching paradigm, would be the main vehicle for skill acquisition. Data generated in the course of practice provide information for assessment as well.

4. Nonprogrammed training. In addition to programmed training, other training experiences would be available for use at the discretion of trainees or assigned at the suggestion of a supervising teacher working closely with the trainee. The facilities provided for these purposes would include (a) appropriate students available for small group discussion or tutoring; (b) audio- and videotaping facilities for self-recording; (c) CAI for the trainee's own use; and (d) a "teacher-training automat" containing a vast array of teacher training films, manuals, books, tapes, etc., indexed as a library. Trainees could pick and choose, browse, or be assigned specific activities by a supervisor. The automat would provide reading and viewing of material representing many alternative and "new" approaches to education as well as material related to other trainee experiences in the training system.

5. Assessment and system revision. Through tests, observations, trainee diaries, supervisors' reports, and analyses of tapes and transcripts, extensive data would be gathered for both formative and summative evaluation purposes. Trainees would have access to all data. A computer record system would accumulate supervisors' observations and other data and provide regular summaries. Simulations as well as situational tests using real school situations would also be used for teacher assessment. At periodic points, a summary of assessments would be made. All data would be used to judge the adequacy of the training and to revise the system for the following year.

6. Assignment and follow-up. Following successful completion of programmed work and practice, the trainee would be ready for assignment, but his introduction to regular teaching duties would be gradual. Training might begin in June, with the trainee's first regular contact with students occurring in September, and his first solo classroom responsibility in January. He could begin to work with a team and would take some extra-curricular committee and supervisory duties. These supervised activities would provide on-the-job training. Further, the nonprogrammed training or "automat" described earlier would be available to him, so that problems and insights could be pursued individually with available training materials as they arose. We have begun to design a portable automat and microteaching laboratory to support such on-the-job training functions. The system would also include regular contact with each trainee for the duration of his professional life, to continue system evaluation in terms of the career patterns of its products.

Target Population Decisions

Given the general specifications of the model system, there are important decisions to be made that would govern the actual implementation of the operating system. Many of these concern the target populations for teacher training.

It was noted earlier that teaching roles are diverse. Peers, parents, counselors, and clergymen, as well as supervisors in most walks of life, all teach. Even within the teaching profession, there may be important differentiations among teaching roles as a function of kind of institution and content of teaching. Then, perhaps, the distinction between preservice and in-service trainees, or between levels of experience among in-service teachers, is important. The most important differentiations may rest, not on characteristics of the teacher, but on characteristics of the learner--age, sex, ethnic and cultural background, or special abilities or disabilities. Finally, one might consider the era in which trained teachers will actually serve. Since the time lag between the development of a new training system and its widespread use is likely to be considerable, we must recognize at the outset

that teachers and learners in the years 1980 to 2000 are likely to differ from those of today in significant ways. The training system must be made adaptable to the future.

The following provisional decisions have been reached regarding target populations:

1. For the time being, the model will aim at the training of regular public school teachers rather than teachers for private or alternative schools, special education programs, remedial tutoring situations, preschool educational centers, military, industrial, or social welfare agencies, or educational television. However, the core training experiences in the model will be aimed at developing generalizable intellectual and interpersonal skills that are potentially useful not only for teachers but for most mature learners. Ultimately, the training system might represent the general skills of teaching and learning, useful for all human beings. But an immediate focus is needed and the training of public school teachers is a clear and present problem.

2. Generalizable intellectual and interpersonal skills should be useful for teachers in all subject-matter areas. Not only is it impossible to choose knowledge domains that are most important for today, it is also impossible to choose those that will be most important tomorrow. Hence, provision should be made for variation of content specialty across teacher trainees, but the system should emphasize no particular current specialty.

3. The system should be designed primarily as a "vestibule" training experience. The concept of vestibule training is borrowed from industry, where employees, no matter where or how educated, are given induction training to fit positions and functions in a particular organization. The educational professions appear to provide the only instances in our society where the receiving organizations accept academic products without systematic induction training of their own. Choosing the vestibule option does not preclude using the system as the core of a university-based teacher education program, or its facilities in continuing in-service training. The system's inherent flexibility should

allow its use throughout a continuing program of teacher education. But strong emphasis is here placed on the vestibule concept because this function has been so underemphasized in the past.

4. The target population of learners has not been precisely identified. It is not clear that the system can be aimed at both elementary and secondary or both urban and suburban populations simultaneously. It can be argued that all teachers must and should be prepared for multicultural experiences, with each particular vestibule model adapting to the needs of its own setting. It can also be argued that age seven, plus or minus one, represents a transition of major importance in the psychological development of children, and that the style and content of teaching must be distinctly different on each side of this critical period. A training system probably cannot deal well with both age ranges, at least not at first. The history and present state of our program seems to equip us best for work with learners of age seven and beyond, so the initial concentration of our training system must be with teaching at those levels. As the system develops, it might be adaptable for use with preschool and primary teachers and this possibility should certainly be explored.

Design Problems

While there are a number of design problems to be addressed in development of the system, two of these pose special difficulties and deserve discussion here.

1. It was stated at the outset that the model training system was aimed only at some categories of specific teaching skills; it was not to be regarded as a model teacher education program. Thus, the system will not include, at least at first, formal academic instruction in content specialities, professional education, or history and philosophy of education. Beyond this, however, defining the boundaries of the training system is no easy matter. What other aspects of teacher preparation are to be excluded, assumed present in the trainee at entry into the system, or obtainable by the trainee through other means? An adequate taxonomy of teaching behavior is not yet in hand, but at least some

crude theoretical conception of teaching is needed to guide these decisions on inclusion or exclusion of specific domains of behavior.

The guiding conception used to organize the Teaching Effectiveness Program's work to date has been described in earlier forms elsewhere (Snow, 1969a; 1969b). It is based on Smith's (1960) cyclical concept of teaching expanded to include additional categories of cognitive activities involved in teacher-learner interaction. In earlier presentations of the Program's work, a cycle of overt and covert teaching events was used to identify skills needed during discussion with a learner. Figure 2 shows two time cycles, representing a "moment-to-moment" stream and a "month-to-month" stream of teaching behavior. One can imagine a teacher engaged in interaction with a learner at a given point in time. The teacher listens for cues about some confusion faced by the learner, generates hypotheses about the source of confusion, decides on a course of action deemed appropriate, and proceeds with explaining and questioning to elicit additional cues. But the moment-to-moment behavior is also guided by a month-to-month plan. The teacher has built up experience with this and other learners and has developed more general strategies for diagnosis, instructional management, and reinforcement. The information available in this encounter is added to prior information in a growing evaluation of the learner's strengths and weaknesses. This diagnosis is used to plan instructional experiences for this particular learner and reinforcement strategies aimed at his particular needs and attitudes.

Perhaps the system can ultimately include elements aimed at all these skill and strategy areas. In the past, the program has concentrated on those areas nearest the point of teacher-learner interaction (see dashed-line enclosure), but our work is moving into additional areas as the training system takes shape (see dotted-line enclosure). It is unlikely that instructional management strategies will be included in the model system, however. This area is a broad one involving the integration of instructional media and methods with curriculum development (see Merrill, 1968, 1969).

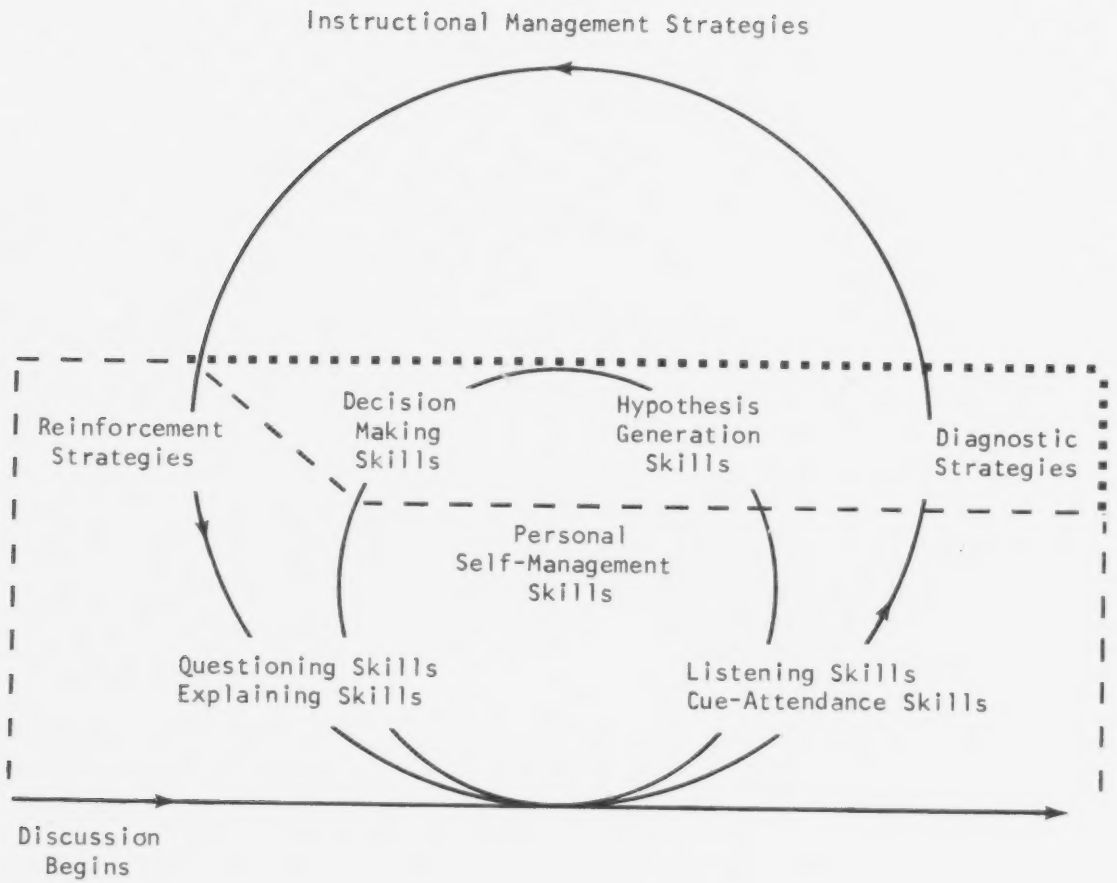

Fig. 2. The temporal course of teacher-learner interaction, showing the hypothesized cognitive activities of a teacher at a given point in time.

It will likely remain in the academic domain and/or require a training system of its own for the preparation of specialists.

2. A key term in the conception of the training system has been the word "adaptive." The effective teacher should be an adaptive teacher with respect to individual differences in learners. The training system should be adaptive to individual differences among teacher trainees. And the system itself must be adaptive to its local setting, gathering formative evaluative information about itself for use in revision.

The first two usages are fairly clear. They point to problems for the development of training experiences but pose no real difficulties for the design of the system. The third usage, however, represents a fundamental design problem. How can the system be so constituted that it adapts to its environment and to changes therein? How can the system be made evolutionary in the same sense that evolutionary computers are now being conceived?

As noted earlier, the system includes an assessment element to be described in detail in a later paper in this series. For now, it must suffice to identify the kinds of information needed for assessment and the kinds of mechanisms needed for revision of the system on the basis of that assessment.

Figure 3 shows nine sources of information pertinent to teacher assessment and/or system revision. Six of these kinds of information emanate directly from training elements in the system, and for each of these sources both teacher and learner variables provide data for use in teacher assessment. For system revision, four other sources of evaluative information are combined with the six. These sources are provided by statements of need by individual teachers during and after training, statements of need by school or district officials in response to changing conditions or new problems, statements of need by a community control board and/or surveys of community views regarding current problems and practices, and finally, career pattern surveys and follow-up studies on teacher trainees.

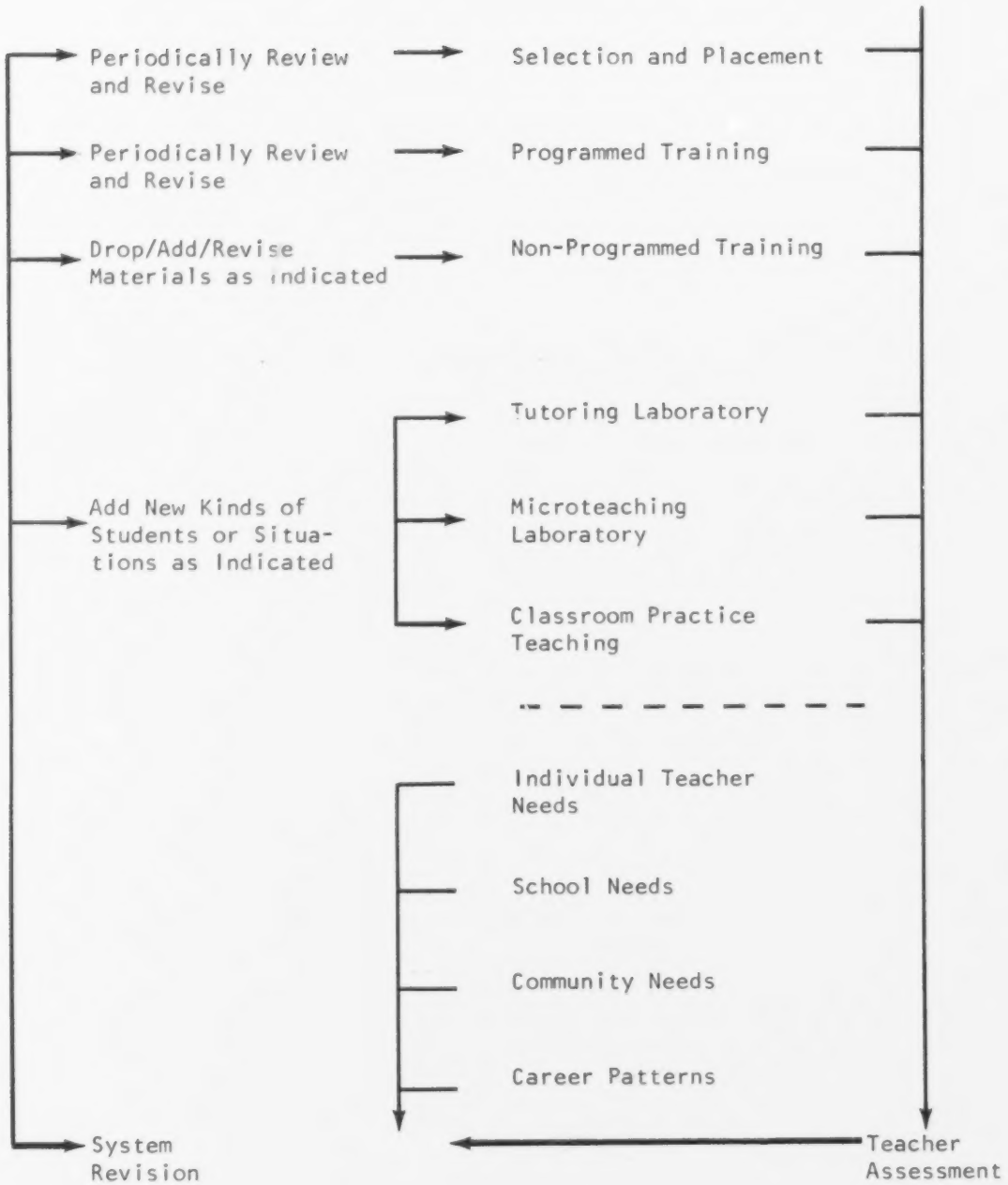

Fig. 3. Sources of information for teacher assessment and system revision.

System revision then takes one of four avenues. Selection and placement procedures are periodically reviewed and revised on the basis of regular validity and reliability studies. These studies investigate not only the overall prediction of success, but also the interaction of teacher aptitude measures with performance in alternative training conditions. On the basis of these data, measures are dropped, added, or revised. The programmed training element receives similar periodic review and revision. While the training experiences that make up this element are not readily dropped, since their presence represents long-standing decisions on basic training needs, they can be constantly adjusted to find optimal combinations of basic training experiences. The nonprogrammed training element is designed to be more fluid. Materials are dropped or added freely as needs and preferences indicate. Revision is rarely undertaken except when source manuals are judged generally important enough for inclusion in the programmed training sequence. Finally, the practice element also conceived as relatively fluid, is revised by dropping or adding kinds of learners or kinds of teaching situations as the needs of individual trainees dictate. Again, the basic structure of practice is not modified, but its content is adapted to the needs of individual teachers as well as emerging school and community needs.

Thus, the assessment element operates continuously within the system. It serves a double function, gathering data for teacher assessment and assignment, while turning those and other data simultaneously to the task of system evaluation and revision.

Summary

The present paper has sketched briefly an overview of the projected Model Teacher Training System. Detailed explication of each element and the steps involved in its development will be presented in subsequent reports. Separate presentations will be prepared for each system element: selection, diagnosis, and placement; programmed training; nonprogrammed training; practice; assignment and follow-up; assessment; and system revision.

Tentative decisions have been made to focus the model system on the vestibule training of public school teachers in skills generalizable across the content areas of science, mathematics, social studies, and English for grades 3-12. It was noted, however, that the training system should be of use at many points in a continuing program of preservice and in-service teacher education. Initial steps have been taken to clarify design problems concerning the particular types of skills to be included in the training system and the means by which the system can be made adaptive to individual, institutional, and community needs. These design decisions and problems may also be the subject of subsequent reports.

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